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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/850,040	05/07/2001	George E. Carter	01 P8145 US	9560

7590 10/16/2006

Siemens Corporation
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EXAMINER	
SINGH, RAMNANDAN P	
ART UNIT	**PAPER NUMBER**
2614	

DATE MAILED: 10/16/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/850,040	CARTER ET AL.	
	Examiner	Art Unit	
	Ramnandan Singh	2614	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *27 July 2006*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-5,8-18 and 22-322* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☒ Claim(s) *16-18* is/are allowed.

6)☒ Claim(s) *1, 3, 8-12, 14-15 and 22-32* is/are rejected.

7)☒ Claim(s) *2,4,5 and 13* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 112

1. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

2. Claim 27 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 27 recites the limitation " A computer program product" in line 1. The disclosure does not disclose what "computer program product" is. This makes the claim indefinite.

3. The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

4. Claims 27-30 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention. Claim 27 recites the limitation " computer code for a processor" in line 3. The "computer program source code" is not disclosed. In absence of the computer program source code as claimed, one of ordinary skill would not be able to make and/or use the invention without undue experimentation [See MPEP 2164.01].

Claim Rejections - 35 USC § 101

5. 35 U.S.C. 101 reads as follows:

> Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

6. Claims 27-30 are rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter. This is because claim 27 recites the limitation " a computer readable medium" that includes **data signal** embodied in a carrier wave [Specification, pp. 8, lines 23-24; and claim 30]. Claims 28 and 29 being dependent from claim 27 are also rejected.

Response to Arguments

7. Applicant's arguments filed on Jul. 27, 2006 have been fully considered but they are not persuasive.

Applicant's argument----"That is, for example, in Paludan, the amplitude of one band is never compared to that of one or more of the other bands. Each is handled individually" on page 11.

Examiner's response---Examiner respectfully disagrees. Paludan states: " noise squelching in each of a plurality of frequency bands is effected by estimation of the absolute quantity of noise by monitoring the amplitude distribution of sound events in each band and comparing the absolute quantity of noise in a current frequency band, in which the gain is to be adjusted, with the absolute quantity of noise in a next high

frequency band, whereby the gain in the current frequency band is reduced, if the noise quantity in this band exceeds the noise quantity in the next high band by more than a predetermined threshold value" [Para: 0010].

Claim Rejections - 35 USC § 103

8. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

9. Claims 1, 3, 8-12, 15, 25-26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Pelaez Ferrigno [US 5,577,161] in view of Paludan-Mueller [US 20020118851 A1].

Regarding claim 1, Pelaez Ferrigno discloses a computer implemented method (using a digital signal processor) of enhancing sound quality for computer telephony systems shown in Fig. 1, comprising:

receiving digital signals including telephony sounds [Fig. 1; col. 2, lines 61-67; col. 1, lines 16-25; col. 1, lines 61-64; col. 2, lines 12-19];

performing time-to-frequency domain conversion on the digital signals [Fig. 1; col. 2, line 67 to col. 3, line 2; col. 4, lines 57-67; col.8, lines 36-46];

detecting whether noise is present in the frequency domain conversion of the digital signals using a speech/non-speech decision logic [Fig. 1; col. 3, lines 2-7]; and

applying a filter to remove the noise if noise was detected in the frequency domain conversion of the digital signals [Fig. 1; col. 3, lines 8-17.; col. 3, line 23 to col. 8, line 35].

Although Pelaez Ferrigno teaches detecting noise based on a signal/non-signal decision in the frequency domain [Fig. 1; col. 3, lines 2-7]; he does not disclose details on how the filter detects noise in the frequency domain. So one of ordinary skill in the art would have been motivated to seek any known method suitable to detect noise in the frequency domain, such as, the method of Paludan-Mueller.

Paludan-Mueller teaches detecting whether noise is present in the frequency domain conversion of the digital signals [Para: 0017] by monitoring the amplitude distribution of sound events in each band and comparing the amplitudes of sounds in a first (i.e. **current**) band with the amplitude of sounds in a second (i.e. **higher**) band to detect whether noise is present depends on one of the three conditions; the amplitude of sounds in the current band is substantially same or smaller or greater than the amplitude of sounds in the higher band by more than a predetermined threshold value [Figs. 1-10; Para: 0010; 0014; 0018-0019; 0027-0031; 0034-0041; claims 1-9]. Thus, Paludan-Mueller teaches detecting noise by examining amplitudes in two frequency bands (i.e. current band and next band).

At the time of the invention, it would have been obvious to a person of ordinary skill in the art to combine the teachings of Paludan-Mueller with Pelaez Ferrigno in order to improve telephone reception by detecting noise using two or more frequency bands and reducing if noise is present [Paludan-Mueller; Para: 0007].

Claim 25 is essentially similar to claim 1 except for detecting whether noise is present in the frequency domain conversion of the digital signals for a first specific time period. Pelaez Ferrigno further teaches detecting whether noise is present in the frequency domain conversion of the digital signals for a first specific time period (i.e. a frame or a sampling period or a window) using a speech/non-speech decision logic [Fig. 1].

Claim 12 is essentially similar to claim 25 and is rejected for the reasons stated above.

Regarding claims 9-10, 26, the different time intervals relate to different sizes of frame use above.

Regarding claim 11, Pelaez Ferrigno teaches the method, wherein the filter is a software filter (i.e. computer implemented) [col. 3, lines 23-31].

Regarding claim 15, Pelaez Ferrigno further teaches averaging a signal [col. 6, lines 15-22].

Regarding claim 3 , Pelaez Ferrigno does no teach expressly the method wherein detecting whether noise is present comprises: comparing the amplitudes of sounds in a first band to the amplitudes of sounds in a second band in the frequency domain conversion of the digital signals; and determining noise is present if the amplitudes of sounds in the first and second bands are substantially the same.

Claim 8 is essentially similar to claim 3 and is rejected for the reasons stated above.

10. Claim 22 is rejected under 35 U.S.C. 103(a) as being unpatentable over Pelaez Ferrigno [US 5,577,161] in view of Sorqvist et al [US 6,658,107 B1].

Regarding claim 22, Pelaez Ferrigno a computer implemented method of enhancing sound quality for computer telephony systems, comprising:

receiving digital signals including telephony sounds [Fig. 1; col. 2, lines 61-67; col. 1, lines 16-25; col. 1, lines 61-64; col. 2, lines 12-19];

performing time-to-frequency domain conversion on the digital signals [Fig. 1; col. 2, line 67 to col. 3, line 2; col. 4, lines 57-67; col.8, lines 36-46];

detecting whether noise is present in the frequency domain conversion of the digital signals if the amplitudes of sounds in a first band in the frequency domain conversion of the digital signals cross a threshold over a time interval (i.e. data frame) using a speech/non-speech decision logic [Fig. 1; col. 3, lines 2-7];

and applying a filter to remove the noise if noise was detected in the frequency domain conversion of the digital signals [Fig. 1; col. 3, lines 8-17.; col. 3, line 23 to col. 8, line 35].

Pelaez Ferrigno does not teach expressly replacing a portion of the noise with comfort noise.

Sorqvist et al teach replacing at least a portion of the noise with comfort noise [Fig. 4; col. 8, lines 27-47].

At the time of the invention, it would have been obvious to a person of ordinary skill in the art to combine the teachings of Sorqvist et al with Pelaez Ferrigno in order to improve telephone reception by filling the resulting holes caused by the removal of the noise [Sorqvist et al; col. 1, lines 52-64].

11. Claim 14 is rejected under 35 U.S.C. 103(a) as being unpatentable over the combination of Pelaez Ferrigno and Paludan-Mueller as applied to claim 12 above, and further in view of either Harris et al [4,255,620] or Fielder [US 5,752,225].

Regarding claim 14, the combination of Pelaez Ferrigno and Paludan-Mueller does not teach expressly the method, wherein the first band includes sounds less than 500 Hertz, the second band includes sounds from 500 to 1500 Hertz and the third band includes sounds greater than 1500 Hertz.

Harris et al teaches a basis for selecting these three sub-bands for detecting speech sounds. It has long been known that the prime intelligibility of human speech lies in the band from about 1000 to about 3000 Hz, and that human speech is naturally temporally divided into higher frequency components (the consonants) occurring in the range from about 1500 to about 3000 Hz and lower frequency components (vowels) occurring in the rang from about o to about 1500 Hz [col. 25-52]. The cross-over region at approximately 500 Hz is a potential distortion region [col. 10, lines 15-47]. Fig. 4F illustrates the time averaged spectrum of signals [Figs. 4E, 4F; col. 10, line 60 to col. 11, line 35].

Fielder teaches an empirical technique for allocating a whole band into sub-bands. Fig. 7 illustrates critical band spectra of the output noise and distortion. Allocation C is then the same as allocation B for frequencies in the upper part of the audio band above 1500 Hz. The dotted line shows the auditory masking curve for a 500 Hz tone [col. 3, line 50 to col. 4, line 43].

At the time of the invention, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to select the three sub-bands of Harris et al or Fielder, wherein the low band includes sounds less than 500 Hz, the middle band includes sounds from 500 to 1500 Hz, and the high band includes sound greater than 1500 Hz with the three sub-bands of Paludan-Mueller. The motivation for this selection of these subbands would have been to use the actual bandwidth occupied by human speech sound, and speed up detecting audio signals [Harris et al; col. 1, lines 11-16].

12. Claims 31-32 rejected under 35 U.S.C. 103(a) as being unpatentable over Pelaez Ferrigno [US 5,577,161] in view of Paludan-Mueller [US 20020118851 A1], and further, in view of Bartkowiak [US 6,711,540 B1].

Regarding claim 31, Pelaez Ferrigno discloses a computer implemented method (using a digital signal processor) of enhancing sound quality for computer telephony systems shown in Fig. 1, comprising:

receiving digital signals including telephony sounds [Fig. 1; col. 2, lines 61-67; col. 1, lines 16-25; col. 1, lines 61-64; col. 2, lines 12-19];

performing time-to-frequency domain conversion on the digital signals [Fig. 1; col. 2, line 67 to col. 3, line 2; col. 4, lines 57-67; col.8, lines 36-46];

detecting whether noise is present in the frequency domain conversion of the digital signals [Fig. 1; col. 3, lines 2-7]; and

applying a filter to remove the noise if noise was detected in the frequency domain conversion of the digital signals [Fig. 1; col. 3, lines 8-17.; col. 3, line 23 to col. 8, line 35].

Although Pelaez Ferrigno teaches detecting noise based on a signal/non-signal decision in the frequency domain [Fig. 1; col. 3, lines 2-7]; he does not disclose details on how the filter detects noise in the frequency domain. So one of ordinary skill in the art would have been motivated to seek any known method suitable to detect noise in the frequency domain, such as, the method of Paludan-Mueller.

Paludan-Mueller teaches detecting whether noise is present in the frequency domain conversion of the digital signals [Para: 0017] by monitoring the amplitude distribution of sound events in each band and comparing the amplitudes of sounds in a first (i.e. current) band with the amplitude of sounds in a second (i.e. higher) band to detect whether noise is present depends on one of the three conditions; the amplitude of sounds in the current band is substantially same or smaller or greater than the amplitude of sounds in the higher band by more than a predetermined threshold value [Figs. 1-10; Para: 0010; 0014; 0018-0019; 0027-0031; 0034-0041; claims 1-9].

At the time of the invention, it would have been obvious to a person of ordinary skill in the art to combine the teachings of Paludan-Mueller with Pelaez Ferrigno in

order to improve telephone reception by detecting noise using two or more frequency bands and reducing if noise is present [Paludan-Mueller; Para: 0007].

Further, although Pelaez Ferrigno teaches a noise reduction method and filter for telephone communications systems [col. 1, lines 16-19], he does not teach expressly detecting noise in the frequency domain conversion of inbound or outbound tones.

Bartkowiak teaches detecting noise in the frequency domain conversion of inbound or outbound tones [Fig. 2; col. 5, lines 4-20; col. 6, line 52 to col. 7, line 59].

At the time of the invention, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to combine the teachings of Bartkowiak with Pelaez Ferrigno in order to enable the digital signal processor of Pelaez Ferrigno to detect maintones in a noisy signal environment and thereby to selectively apply the noise reduction filter of Pelaez Ferrigno to remove the noise from the tone [Bartkowiak; col. 1, lines 50-53].

Regarding claim 32, the limitations are shown above.

13. Claims 23 –24 are rejected under 35 U.S.C. 103(a) as being unpatentable over the combination of Pelaez Ferrigno and Sorqvist et al as applied to claim 22 above, and further in view of Bartkowiak [US 6,711,540 B1].

Regarding claim 23, the combination of Pelaez Ferrigno and Sorqvist et al does not teach expressly using a low-pass filter or a high-pass filter to remove noise.

Bartkowiak teaches detecting noise in the frequency domain conversion of inbound or outbound tones and remove the noise when noise is detected [Fig. 2, element 208; col. 5, lines 4-20; col. 6, line 52 to col. 7, line 59].

At the time of the invention, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to combine the teachings of Bartkowiak with Pelaez Ferrigno in order to remove the noise when noise is detected [Bartkowiak; col. 1, lines 50-53].

Regarding claim 24, Bartkowiak teaches a signal averaging filter [Fig. 2; element 210].

Allowable Subject Matter

14. Claims 16-18 would be allowable.

15. Claims 2, 4-5, 13 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

16. The following is a statement of reasons for the indication of allowable subject matter:

Claim 16 identifies the uniquely distinct feature of the computer implemented method of enhancing sound quality for computer telephony systems, comprising: detecting whether noise is present in the frequency domain conversion of the digital signals if the amplitudes of sounds in a middle band exceed the amplitudes of sounds in low and high bands by a predetermined amount. As such, claim 16 requires comparing the amplitude of sounds in a middle band with amplitudes of sounds in both low and high bands simultaneously. While the closes prior art, Pahudan-Mueller [UDS 20020118851 A1], Murii [US 6,205,421 B1], and Pastor et al [US 6,445,801 B1] each teach comparing the amplitudes of sounds, Pahudan-Mueller using the amplitude of sounds in a current band with the amplitude of sounds in a next band, Murii comparing the amplitude of sounds in a current band with a threshold, and Pastor et al comparing the amplitude of sounds for a specific time period in a current band with a threshold; none of them suggest or teach comparing the amplitude of sounds in a current band

with amplitudes of sounds in two other bands simultaneously. As such, the prior art, either singularly or in combination, fail to anticipate or render the above underlined limitation obvious.

Therefore claim 16 is indicated allowable.

Claims 17-18 being dependent from claim 16 are also indicated allowable.

Dependent claims 2, 4 and 13 are objected to for the reasons given for claim 16 above. Claim 5 being dependent from claim 4 is also objected.

Conclusion

17. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ramnandan Singh whose telephone number is (571) 272-7529. The examiner can normally be reached on M-TH (8:00-5:30).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Fan Tsang can be reached on (571) 272-7547. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Ramnandan Singh
Examiner
Art Unit 2614